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Class: EMBRYOLOGY
Time:

Course #: EMBRYO

	50	60	70	80	C
Test Key:	CBDADCACDA	CDDDACACAD	DBADDEDEDE	BCEEADEABB	BBBDDCEEDA
Items 1-50:	1234567890	1234567890	1234567890	1234567890	1234567890
Student's Answers:	*C*C**D***	BCCB*B**D*	*****ED****	*****C*C***	*****C***

	50	60	70	80	C
Test Key:	CEACDCEBAB	ADCCBDAEBB	BEECDADBDB	CDABCDADBB	CBDADDEBAD
Items 51-100:	1234567890	1234567890	1234567890	1234567890	1234567890
Student's Answers:	*****C*	*****C*	EA*****C	*****C*	**C*E*C***

EXAM 1 Form A

Possible Points:	100
Raw Score:	80
Objective Score:	80
Essay Score:	
Percent Correct:	80%

CUMULATIVE

Possible Points:	0
Raw Score:	0
Percent Correct:	--
In-progress Grade:	

NAME

James Coyne

DATE

4-1-94

EMBRYOLOGY MID-TERM EXAMINATION - 1994

SELECT THE SINGLE BEST ANSWER

QUESTIONS 1 TO 7

- A. $2N$ (N = Amount of DNA in a gamete)
 B. $2C$ (C = Amount of unique genetic information in a gamete)
 C. Both A and B are correct
 D. Neither A nor B is correct

- C 1. $2N$ Normal somatic cell $2N$
 S 2. $4N$ Ovarian reproductive cells at birth $2N$
 D 3. $1N$ Reproductive cell found in duct of epididymis $1N$
 A 4. $1N$ Reproductive cell ovulated from ovary $2N$
 D 5. $1N$ Spermatid $1N$
 C 6. $2N$ Testicular reproductive cells at birth $2N$
 A 7. $1N$ Secondary oocyte $1N$

QUESTIONS 8 TO 13

- A. Trophoblast
 B. Embryoblast
 C. Both A and B are correct
 D. Neither A nor B is correct

- C 8. According to book, origin of cells that normally come into contact with amniotic fluid
 D 9. Contains cells of uterine endometrial origin
 A 10. Forms tissues that produce human chorionic gonadotrophin
 C 11. Forms blood vessels containing fetal blood
 D 12. Genetically equivalent to mother
 D 13. Usually has two X chromosomes in related nuclei

Embryo
 Trophoblast

Embryo
 Trophoblast

QUESTIONS 14 TO 19

- A. Epiblast
- B. Hypoblast
- C. Both A and B are correct
- D. Neither A nor B is correct

- 14. Origin of most of chorion ~~A~~ D *D - remaining chorion includes cytotrophoblast & syncytiotrophoblast*
- 15. Origin of ectodermal germ layer ~~A~~ A
- 16. Origin of cells forming oropharyngeal membrane ~~E~~ C
- 17. Origin of mesoderm germ layer ~~A~~ A
- 18. Origin of endodermal germ layer ~~E~~ C
- 19. Origin of notochordal process ~~A~~ A

QUESTIONS 20 TO 25

- A. Umbilical artery
- B. Umbilical vein
- C. Both A and B are correct
- D. Neither A nor B is correct

- 20. Contains maternal blood ~~D~~ D
- 21. Develops within the yolk sac ~~D~~ D
- 22. Carries oxygenated blood ~~B~~ B
- 23. Transports blood to the placenta ~~A~~ A
- 24. Lined by syncytiotrophoblast ~~D~~ D *D lined by cytotrophoblast*
- 25. Formed primarily from mesoderm situated within embryo ~~D~~ D *D form outside embryo*

QUESTIONS 26 TO 30

- A. Decidua parietalis
- B. Syncytiotrophoblast
- C. Cytotrophoblast
- D. Decidua basalis
- E. None of the above (A - D)

- 26. ✓ Produces Early Pregnancy Factor *hCG is produced before trophoblast differentiate*
- 27. "Maternal" portion of placenta ~~D~~ D
- 28. Situated between implanted conceptus and uterine lumen ~~E~~ decidua capsularis
- 29. Contains blood vessels that open into intervillous spaces of placenta ~~D~~ D
- 30. Usually degenerates completely ~~E~~ decidua capsularis

QUESTIONS 31 TO 34

- A. Post-fertilization week 1
- B. Post-fertilization week 2
- C. Post-fertilization week 8
- D. Post-fertilization week 12
- E. None of the above (A - D)

- 31. Implantation completed *12*
- 32. Major organogenesis completed *8*
- 33. Viable fetus (capable of free life) *12*
- 34. Normal amount of subcutaneous adipose tissue (fat) observable *12*

QUESTIONS 35 TO 43

- A. Ectoderm
- B. Mesoderm
- C. Endoderm
- D* D. A and B are correct
- E. B and C are correct

- A* 35. Epithelium of oral cavity *ect + A*
- D* 36. Skin *ecto + meso D*
- E* 37. Small and large intestine *derm + endoderm B & E*
- E* 38. Central nervous system *ecto A*
- B* 39. ✓ Humerus (bone of arm) *mesoderm B*
- E* 40. Vertebra *meso B*
- B* 41. Endothelium of blood vessels *meso B*
- E* 42. ✓ Skeletal muscle in upper limb *meso B*
- E* 43. Somites *meso B*

A
D
E
A
B
B
B

go to 27 11

SELECT THE SINGLE BEST ANSWER

QUESTIONS 44 TO 60

- 44. Which of the following tissues normally comes into direct contact with endometrial interstitial tissue fluid?
- A. Syncytiotrophoblast
- B. Cytotrophoblast
- C. Fetal blood
- D* D. A and B are correct
- E. A, B, and C are correct

45. The expected time of birth is usually
- A. 38 weeks after fertilization
 - B. 40 weeks after the last normal menstrual period (LNMP)
 - C. ~~26 weeks after fertilization~~
 - ☒ D. A and B are correct
 - E. A, B, and C are correct
46. Which of the following structures is a constant portion of the tissues that normally separate fetal blood from maternal blood in the placenta
- A. maternal endothelium *blood is exchanged into intervillous space*
 - B. cytotrophoblast *regenerated*
 - ☒ C. fetal endothelium
 - D. A and B are correct
 - E. A, B, and C are correct
47. Which of the following does not belong in the group?
- A. Cells in amniotic fluid
 - B. Fetal blood cells *embryo*
 - C. Cells of chorionic villi *embryo*
 - D. Cells of inner cell mass *embryo*
 - ☒ E. Decidual cells *maternal cells*
48. A fetus born at which of the following times would usually be viable (capable of free living)
- A. 38 weeks after fertilization
 - B. 40 weeks after the last normal menstrual period (LNMP)
 - C. 26 weeks after fertilization *6 1/2 months*
 - D. A and B are correct
 - ☒ E. A, B, and C are correct
49. The diaphragm receives its motor and sensory innervation from
- A. cervical nerves *C3-C5*
 - B. thoracic nerves
 - C. lumbar nerves *NO*
 - ☒ D. Both A and B are correct
 - E. A, B, and C are correct

50. Which of the following does not belong in the group?

- ☒ A. Dermis
- B. Epidermis *ectoderm*
- C. Lens of eye *ectoderm*
- D. Neural tube
- E. Neural crest *ectoderm*

51. Which of the following does not belong in the group?

- A. Central tendon of diaphragm
- B. Connective tissue of liver
- ☒ C. Pleuroperitoneal membrane *not from septum transversum*
- D. Ventral mesentery (lesser omentum and falciform ligament)

52. Which of the following does not belong in the group?

- A. Anterior and lateral body wall mesoderm
 - B. Dorsal mesoesophagus *mesoderm*
 - C. Pleuroperitoneal membrane
 - D. Septum transversum
 - ☒ E. Ventral mesentery (lesser omentum and falciform ligament)
- common to all*


53. Which of the following does not belong in the group?

- ☒ A. Amniotic cavity
- B. Chorionic cavity (extraembryonic coelom)
- C. Pericardial cavity
- D. Peritoneal cavity *extraembryonic*
- E. Pleural cavity *extraembryonic*

54. Which of the following does not belong in the group?

- A. Assists in prevention of polyspermy *zona pellucida*
- B. Assists in timing of implantation
- ☒ C. Composed of cells *Zona pellucida*
- D. Found within ovarian follicle

55. Which of the following does not belong in the group?

- A. Primordial germ cells
 - B. Fetal blood cells
 - C. Digestive tract epithelium
 - ☒ D. Umbilical vessels
- 

56. Polyhydramnios (excess amniotic fluid) may be indicative of maldevelopment of the
- A. Maternal vasculature to the placenta
 - B. Fetal urinary system
 - ☒ C. Fetal nervous system
 - D. Fetal cardiovascular system
 - E. Fetal respiratory system
57. A viral infection during the thirteenth week of development would cause fetal death because of faulty morphological development of which of the following organ-systems?
- A. Nervous system
 - B. Digestive system
 - C. Respiratory system
 - D. Cardiovascular system
 - ☒ E. None of the above is correct
58. The last normal menstrual period (LNMP) usually occurs
- A. four weeks before fertilization
 - ☒ B. two weeks before fertilization
 - C. at the time of fertilization
 - D. two weeks after fertilization
 - E. four weeks after fertilization
59. The region of the embryonic body that would be the last to complete its major morphologic development is normally the
- ☒ A. anterior perineum (genital region)
 - B. back in thoracic region
 - ☒ C. hand
 - D. head
 - E. thigh
60. A persistent neurenteric canal (remanent of notochord development) would connect the region of the spinal cord to the lumen of the
- A. amniotic cavity
 - ☒ B. intestinal tract
 - C. intraembryonic coelom
 - D. extraembryonic coelom
 - E. allantois

61. All of the following statements regarding myelination are incorrect EXCEPT:
- ☒ A. Some motor fibers descending from higher brain centers to the spinal cord are not myelinated until post natal life.
 - B. Myelin sheaths around nerve fibers in the spinal cord are formed by Schwann cells.
 - C. Myelination of many nerve fibers begins early in embryonic development.
 - D. Myelin sheaths around nerve fibers of peripheral nerve fibers (outside C.N.S) are formed by oligodendrocytes.
 - E. Neural crest cells serve no function in the process of myelination.
62. All of the following statements are correct EXCEPT:
- A. The posterior neuropore closes later than the anterior neuropore.
 - B. Neuropore closure coincides with establishment of a blood vascular circulation for the neural tube.
 - C. The ependymal cells differentiate from neuroepithelial cells.
 - ☒ D. The lateral (intermediate) gray columns of the cord related to the autonomic nervous system take origin from alar plates.
 - E. The sulcus limitans separates alar and basal plates.
63. At eight weeks of embryonic life, the conus medullaris (caudal end of cord) can be located at approximately the level of vertebral body:
- A. Lumbar - 1
 - B. Lumbar - 3
 - ☒ C. Coccygeal - 4
 - D. Coccygeal - 1
 - E. Sacral - 1
64. Major neural crest derivatives would include all but one of the following:
- A. Adrenal medulla
 - B. Spinal ganglia
 - ☒ C. Microglia
 - D. Parasympathetic ganglia
 - E. Melanocytes
65. In early days after birth, an infant does not pass fecal material and develops abdominal swelling. An anal opening is present. The most likely cause of the diagnosed megacolon (Hirschsprung's disease) is related to:
- A. Neural tube closure
 - ☒ B. Neural crest cell migration
 - C. German measles (rubella)
 - D. Neuroepithelial cell proliferation
 - E. Spinal nerve formation

66. Following the normal delivery of a male child, a large swelling was noted over the lower part of his lumbar vertebral column which was covered by skin. Closer examination revealed a vertebral arch defect, a protrusion of spinal cord and meninges. The legs showed hyperextension at the knees and feet were held awkwardly. Your diagnosis is:

- A. Spina bifida occulta
- B. Spina bifida with meningocele
- C. Myelocele (Spina bifida with myeloschisis)
- ☒ D. Spina bifida with meningomyelocele
- E. Meroanencephaly

67. The neuroepithelium will give rise to all but one of the following:

- ☒ A. Leptomeninges
- B. Neurons in the spinal cord
- C. Glioblasts
- D. Neuroblasts
- E. Ependymal cells

68. The most severe type of spinal cord congenital anomaly is called:

- A. Spinal dermal sinus
- B. Spina bifida occulta
- C. Spina bifida with meningocele
- D. Spina bifida with meningomyelocele
- ☒ E. Spina bifida with myeloschisis

69. The main sensory nucleus of cranial nerve V, sensory nucleus of cranial nerve VII and vestibular and cochlear nuclei of cranial nerve VIII form in:

- A. Neural crest migrations
- ☒ B. The alar plates
- C. The basal plates
- D. The roof plates
- E. The floor plates

70. The rhombencephalic lip development that helps form the cerebellum is found in:

- A. The myelencephalon
- ☒ B. The metencephalon
- C. The mesencephalon
- D. The diencephalon
- E. The prosencephalon

71. The thalamic nuclei are related to development of the

- diencephalon*
- A. Basal plates
 - B. Alar plates
 - C. Floor plates
 - D. Rhombencephalic lips
 - ☒ E. Lamina terminalis

72. The portion of cerebellum having its major connections with the vestibular nuclei is the:

- deep cerebellar nuclei*
- ☒ A. Paleocerebellum (vermis and anterior lobe)
 - ~~B. Deep cerebellar nuclei~~
 - C. Neocerebellum (posterior lobe)
 - D. Superior cerebellar peduncles
 - E. Archicerebellum (flocculonodular lobe)

73. All but one of the following would have some relationship to the formation of the choroid plexi:

- A. Ependymal layer
- B. Pia mater
- C. Vessels of the pia mater
- D. Tela choroidea
- ☒ E. Dura mater

74. The corpus striatum, later to become the caudate and lentiform nuclei, originates from:

- A. The wall of the diencephalon
- B. The lamina terminalis
- ☒ C. Floor of the cerebral hemispheres
- D. The hippocampus
- E. The hypothalamus

75. The major commissures originate from:

- A. The cerebral hemispheres
- B. The diencephalon
- C. The cerebellum
- ☒ D. The lamina terminalis
- E. The mammillary bodies

76. A newborn child was found to have a congenital anomaly involving both the lower brain stem (a tongue-like projection behind the skull with displacement of the medulla and cerebellum) and a protruding spinal cord with meninges. The diagnosis would most likely be:
- ☒ A. Arnold-Chiari malformation
 - B. Meroanencephaly
 - C. Meningoencephalocele
 - D. Hydrocephalus
 - E. Hydranencephaly
77. A 1-month old boy was taken to the hospital because his head appeared abnormally large. Examination showed an enlarged head, globular in shape with forehead bulging. CT scan showed dilation of the lateral and third ventricles. Your diagnosis is:
- A. Anencephaly
 - B. Microcephaly
 - C. Meningoencephalocele
 - ☒ D. Hydrocephalus
 - E. Hydranencephaly
78. The fornix (fimbriae, pillars, body) is most closely related to the development of:
- A. The corpus striatum
 - ☒ B. The hippocampus
 - C. The commissures
 - D. The lamina terminalis
 - E. The corpora quadrigemina (colliculi)
79. A 6-month old male was seen to have a swelling at the root of the nose. It had gradually increased in size since first seen at birth. The swelling was fluctuant (moved in waves) and felt between the frontal and nasal bones. CT scan showed frontal lobes and ventricles and meninges protruding in the midline Your diagnosis is:
- A. Benign cyst
 - B. Cranioschisis with meningocele
 - C. Cranioschisis with meningoencephalocele
 - ☒ D. Cranioschisis with meningoencephalocele
 - E. Hydrocephalus

80. The optic stalks develop as diverticula from:

- A. The telencephalon
- ☒ B. The diencephalon
- C. The mesencephalon
- D. The metencephalon
- E. The myelencephalon

81. The cornea of the eye is formed:

- A. Entirely from mesenchyme
- B. Solely from surface ectoderm
- ☒ C. From surface ectoderm and neural crest mesenchyme
- D. From neural ectoderm and neural crest mesenchyme
- E. Solely from neural crest mesenchyme

82. An infant was born blind and deaf with congenital heart disease. The mother had a severe infection early in her pregnancy. Select the **CORRECT** statement.

- A. ~~Cataract is common when severe infections occur after 8 weeks of pregnancy.~~
- B. ~~Genetic factors rarely play a role in congenital deafness~~
- C. ~~Environmental teratogens play no role in congenital eye abnormalities~~
- ☒ D. The embryo was probably infected by the rubella virus from the mother's German measles.
- E. ~~Because of the simplicity of eye development, many anomalies are very common.~~

83. A 2-month-old girl was taken to an ophthalmologist and was found to have remnants of the iridopupillary membrane stretching across her pupil. This membrane originates from:

- ☒ A. Mesenchyme
- B. Neural ectoderm
- C. Skin ectoderm
- D. Invading neural crest cells
- E. Vitreous humor

84. An infant was born with partial detachment of the retina on one eye. The congenital detachment is related to:

- A. Failure of the optic (choroid) fissure to close
- ☒ B. Separation of the two embryonic retinal layers
- C. Failure of invasion of neural crest cells
- D. Failure of the vitreous body to form from mesenchyme
- E. The formation of a coloboma

85. Which of the following statements is NOT true?

- A. The malleus and incus are derivatives of the 1st arch cartilage.
- B. The meatal plug is related to the 1st pharyngeal groove
- ☒ C. The tubotympanic recess is related to the 2nd pharyngeal pouch. *1st pouch*
- D. The tympanic membrane develops from ectoderm, mesoderm and endoderm.
- E. The otic vesicle is ectodermal in origin.

86. The cochlear and vestibular ganglion cells originate from:

- A. Migrating cells from the 1st pharyngeal arch
- B. Migrating cells from the 2nd pharyngeal arch
- C. Neuroepithelium from the developing C.N.S.
- ☒ D. Neural crest cells
- E. Endoderm of the tubotympanic recess

87. The tympanic (middle ear) cavity develops from:

- ☒ A. The distal portion of the tubotympanic recess
- B. The otic vesicle
- C. Breakdown of local mesenchyme
- D. Expansion of the first pharyngeal groove
- E. The otic vesicle

88. The organ of Corti develops from:

- A. The distal portion of the tubotympanic recess
- B. The otic capsule
- C. Embryonic mesenchyme
- ☒ D. The otic vesicle
- E. Invading neural crest cells

89. An infection or teratogen which could result in congenital anomalies of both the eye and ear would have its major impact if it occurred:

- A. After 8 weeks
- ☒ B. 4 - 8 weeks *critical period*
- C. 1 - 3 weeks
- D. Postnatally
- E. Just before birth

90. ✓ The lacrimal glands develop from:

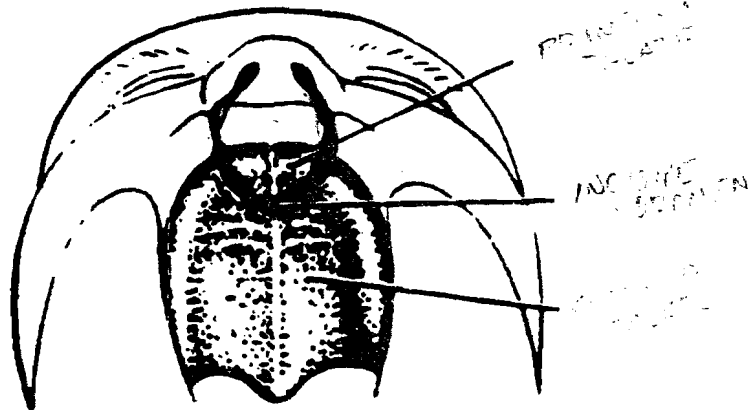
- A. Neural ectoderm
- B. Surface ectoderm
- ☒ C. Invading neural crest cells
- D. The 1st pharyngeal pouch
- E. The developing cornea

91. All of the following are associated with the first pharyngeal arch complex EXCEPT:

- A. Cranial nerve V
- B. Portions of the upper lip
- ☒ C. Stapes bone *arch II*
- D. Dermis of skin over cheek
- E. Mucosa of anterior two-thirds of tongue

92. All of the following organs/structures make their appearance during the 4th week of development EXCEPT:

- A. Thyroglossal duct
- ☒ B. Secondary palate
- C. Lateral lingual swellings (distal tongue buds)
- D. Nasal placode
- E. Pharyngeal arch 3



93. The defect illustrated above could best be explained as a failure of fusion between the

- A. ~~two halves of the primary palate.~~
 - B. ~~two halves of the secondary palate.~~
 - ☒ C. maxillary process and the secondary palate.
 - D. primary palate and secondary palate.
 - E. ~~mandibular processes with one another.~~
- b. 1st pharyngeal arch cleavage*

94. All of the following are true regarding the development of the face **EXCEPT**:

- ☒ A. The stomodeum is occluded by fusion of the two lateral nasal swellings.
- B. the series of swellings which develop is primarily a result of inward migration of neural crest cells. ✓
- C. Failure of fusion of the two medial nasal swellings would create a midline cleft. ✓
- D. The frontonasal swellings is associated with the headfold.
- E. The lateral nasal swellings normally fuse with the maxillary process of the same side. ✓

95. All of the following develop from a pharyngeal pouch **EXCEPT**:

- A. Thymus gland pouch ✓
- B. Pharyngotympanic (Eustachian) tube pouch ✓
- C. Superior parathyroid gland pouch ✓
- D. Lymphoid tissue of palatine tonsil pouch ✓
- ☒ E. Parafollicular cells of thyroid gland ultimobranchial body

96. Pharyngeal arches caudal to the third contribute to the following **EXCEPT**:

- A. Thyroid cartilage
- B. Cricoid cartilage
- C. Innervation of the stylopharyngeus muscle
- ☒ D. Hyoid bone arch 2 ✓
- E. Pharyngeal constrictor muscles

97. The hypobranchial eminence is associated with pharyngeal arch

- A. 1 ✓
- B. 2 ✓
- ☒ C. 3 ✓
- D. 4
- ☒ E. More than one of the above

98. The lateral palatine plates (shelves) initially lie on the vertical plane, due primarily to the presence of the

- A. Nasal septum
- ☒ B. Tongue
- C. Mandibular processes
- D. Lateral nasal swellings
- E. Primary palate